

REMARKS

With the above amendments, claims 1, 5, and 9-12 have been amended and claims 26-32 have been added. Claims 1-32 are pending and ready for further action on the merits. No new matter has been incorporated. The element "said hitting face has at least partially a hitting portion which consists of said metallic material with a thickness of 1 to 3 mm" of claims 1 and 5 has support in figures 3, 4(A) and 5.

Rejections under 35 USC §112, second paragraph

Claims 9-12 have been rejected under 35 USC §112, second paragraph as being indefinite. The Examiner has asserted that these claims disclose a broader genus than the claims from which they depend. Claims 9-12 are rejected for having broader Young's modulus than is disclosed in claim 1. Further, the Examiner asserts that claim 11 discloses a broader Vicker's hardness than does claim 5 (the claim from which it depends).

Claims 9-12 have been amended to fit into the genus of the claims from which they depend. It is believed that the rejection has been obviated. Withdrawal of the rejection is respectfully requested.

Rejections under 35 USC §103

Claims 5-8, 11-13, 15, 17, 19, 21, and 23-25 have been rejected under 35 USC §103(a) as being unpatentable over Peker '642 (US Patent No. 5,896,642).

Claims 1-4, 9-10, 14, 16, 18, 20, and 22 have been rejected under 35 USC §103(a) as being unpatentable over Peker '642 in view of Aizawa '968 (US Patent No. 5,465,968). The Examiner uses Aizawa '968 to disclose a hitting face thickness of 2-3 mm. See claims 7-8 in Aizawa '968. We believe that the motivation for combining Peker '642 and Aizawa '968 is lacking. These rejections are traversed for the following reasons.

Present Invention

The present invention is directed to a golf club head which includes a hitting face formed from a metallic material having a specific relationship between the Young's modulus and tensile strength properties thereof, as are recited in claims 1 and 21. Claims 1 and 21 additionally recite ranges for each of the Young's modulus and tensile strength properties. Alternative embodiments of the golf club head include a specific relationship between the Young's modulus and Vickers hardness properties, as recited in claim 5, for example. Ranges for the Young's modulus and Vickers hardness are also recited in claim 5.

Advantages exhibited by embodiments of the present invention are evidenced by the comparative test results shown in Tables 1-3 at

pages 23-25 of the specification, for example. Note that upon selection of; (1) either the Young's modulus/tensile strength relationship or the Young's modulus/Vickers hardness relationship, and (2) the correct alloy which satisfies the applicable ranges for these properties results in advantageously enhanced minimum frequency and hitting feeling properties as evidenced by the comparative test results. Thus, the inventors have discovered that selective properties with regard to selective alloys results in advantageously, unexpected properties.

Disclosure of Peker '642

Peker '642 discloses a metallic article that is fabricated by providing a die and a piece of a bulk-solidifying amorphous metallic alloy having a glass transition temperature. The bulk-solidifying amorphous metallic alloy is heated to a forming temperature of from about $0.75 T_g$ to about $1.2 T_g$ and forced into the die cavity at the forming temperature under an external pressure of from about 260 to about 40,000 pounds per square inch, thereby deforming the piece of the bulk-solidifying amorphous metallic alloy to a formed shape that fills the die cavity. Peker '642 discloses preferred embodiments wherein the pressure is applied to the piece of the bulk-solidifying amorphous metallic alloy as it is heated, and the heating rate is at least about 0.1°C/s .

Disclosure of Aizawa '968

Aizawa '968 discloses a golf clubhead that is constructed such that a cavity portion having a face plate supporting wall at its bottom is provided in a face portion of a metal head body so that a face plate made of beryllium is mounted on the cavity portion.

Aizawa '968 further discloses a face insert formed by pure beryllium with a thickness of 2 to 6 mm.

Removal of Peker '642 and Aizawa '968

Peker '642 fails to disclose a golf club head, which comprises a hitting face formed by a metallic material having a Young's modulus of 3,000 to 12,000 kgf/mm², a Vickers hardness of 400 to 1,000 RV, a tensile strength of 105 to 175 kgf/mm², a relationship between a Young's modules and a tensile strength as defined by claims 1 and 21, and a relationship between a Young's modulus and a hardness as defined by claim 5. Also, Peker '642 fails to disclose the element "said hitting face has at least partially a hitting portion which consists of said metallic material with a thickness of 1 to 3 mm" of claims 1 and 5 and claims dependent thereon. Peker '642 discloses a back face, 69 (see the figure on the first page of Peker '642) that will be supported by a head body, 60.

Thus, the Examiner has failed to make out a *prima facie* case of obviousness with regard to the 35 USC §103(a) rejection over

Peker '642. Three criteria must be met to make out a *prima facie* case of obviousness.

- 1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. ✓
- 2) There must be a reasonable expectation of success ✓
- 3) the prior art reference (or references when combined) must teach or suggest all the claim limitations. disagree

See MPEP §2142 and *In re Vaeck*, 20 USPQ2d 1438 (CAFC, 1991). In particular, the Examiner has failed to meet the third element to make a *prima facie* obviousness rejection. The Office Action enumerates

it would have been obvious to modify the face of Peker to have a Young's modulus and tensile strength as defined by the claims in order to have face which has sufficient flux for a specific golfer. In addition, it would have been obvious to have a hardness as defined by the claims in order to have a face which maximizes the transfer of energy to a ball at impact.

This statement shows that a *prima facie* case has not been met. The Peker '642 reference does not teach or suggest all of the claim limitations, because as the Examiner asserts modification of the face is necessary. Further, Peker '642 fails to disclose the element "said hitting face has at least partially a hitting portion which consists of said metallic material with a thickness of 1 to 3 mm". Thus, because all of the claim elements are not

met in Peker '642, a prima facie case of obviousness has not been made. Withdrawal of the rejection is not only warranted, but also respectfully requested.

With respect to the rejection over Peker '642 in view of Aizawa '968, this rejection is traversed for the following reasons.

Aizawa '968 discloses a face insert formed by pure beryllium with a thickness of 2 to 6 mm. Pure beryllium has a high Young's modulus ($294 \times 10^9 \text{ N/m}^2 = 30,000 \text{ kgf/mm}^2$), that differs considerably from the Young modulus of the metallic material of claim 1 (i.e. a Young's modulus of 3,000 to 12,000 kgf/mm²), claim 5, and claim 21. Further, the Applicants believe that the Young's modulus of Aizawa '968 also differs considerably from the Young's modulus of Peker '642. Consequently, the Applicants believe that it is inappropriate to use the teachings of Aizawa '968 to modify the thickness of the face of Peker '642. Because of the vastly different teachings of Peker '642 and Aizawa '968, the motivation to combine the references appears to be lacking.

Not used

Accordingly, it appears that the Examiner is using hindsight reconstruction to arrive at the instant invention. Only knowledge in advance of the presently claimed invention could lead one of skill in the art to the combination that is taught in the instant invention. However, to "imbue one of ordinary skill in the art with knowledge of the invention . . ., when no prior art

references or record convey or suggest that knowledge is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." See *W.L. Gore & Assoc. v. Garlock, Inc.* 220 USPQ 303, 311 (Fed. Cir., 1983).

Further, Aizawa '968 also discloses a back of a face insert that is supported by a face plate support wall (support member). This face lacks the excellent characteristics of the metallic material of the instant invention because, in Aizawa '968, the face support wall controls the face insert bending. Thus, the instant invention has unexpectedly advantageous properties that are neither disclosed nor suggested by the teachings of Peker '642 and Aizawa '968, used either separately or improperly combined.

Thus, Peker '642 in view of Aizawa '968 can not render obvious the instant invention. Accordingly, withdrawal of the rejection is respectfully requested.

With the above remarks and amendments, it is believed that the claims, as they now stand, define patentable subject matter such that a passage of the instant invention to allowance is warranted. A Notice to that effect is earnestly solicited.

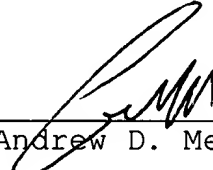
If any questions remain regarding the above matters, please contact Applicant's representative, Andrew D. Meikle, in the Washington metropolitan area at the phone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By



Andrew D. Meikle, #32,868

BS
ADM/TBS/crt

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claim 1. (Three times Amended) A golf club head comprising a hitting face for golf balls, said hitting face formed at least partially by a metallic material, and said metallic material satisfying the following relation:

$$y \geq 0.006x + 60$$

wherein

x is Young's modulus in units of kgf/mm^2 , and

y is tensile strength in units of kgf/mm^2 , and

wherein said metallic material has a Young's modulus of 3,000 to 12,000 kgf/mm^2 , a tensile strength of 80 to 400 kgf/mm^2 [and a thickness of 1 to 3 mm] and said hitting face has at least partially a hitting portion which consists of said metallic material with a thickness of 1 to 3 mm.

Claim 5. (Three times Amended) A golf club head comprising a hitting face for golf balls, the surface of said hitting face being formed at least partially by a metallic material satisfying the following relationship:

$$z \geq (x/60) + 200$$

wherein x is Young's modulus in units of kgf/mm^2 , and z is Vickers hardness in units of HV, and

wherein said metallic material has a Young's modulus of 3,000 to 12,000 kgf/mm² and a Vickers hardness of 400 to 1,000 HV and said hitting face has at least partially a hitting portion which consists of said metallic material with a thickness of 1 to 3 mm.

Claim 9. A golf ball club head according to claim 1, wherein said metallic material has a Young's modulus of 5,000 to 12,000 [20,000] kgf/mm² and a tensile strength of 105 to 400 kgf/mm².

Claim 10. A golf ball club head according to claim 1, wherein said metallic material has a Young's modulus of 5,000 to 12,000 [16,000] kgf/mm² and a tensile strength of 130 to 400 kgf/mm².

Claim 11. A golf ball club head according to claim 5, wherein said metallic material has a Young's modulus of 5,000 to 12,000 [20,000] kgf/mm² and a Vickers hardness of [300] 400 to 1,000 HV.

Claim 12. A golf ball club head according to claim 5, wherein said metallic material has a Young's modulus of 5,000 to 12,000 [16,000] kgf/mm² and a Vickers hardness of 400 to 1,000 HV.